

# PICTURE OF THE MONTH

## Near-Simultaneous Aircraft and Satellite Observations Over Western Canada and the Northeast Pacific

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During the first 2 weeks of May 1970, special aircraft and surface data were obtained for comparison with various types of satellite data. This article discusses the appearance of some meteorological features from both of these observing levels.

Figure 1 is the ESSA 9 Advanced Vidicon Camera System (AVCS) satellite view of the eastern Pacific on the afternoon of May 8, 1970. At that time, a long frontal band stretched along the coast from northern California northward to Canada. The poorly defined

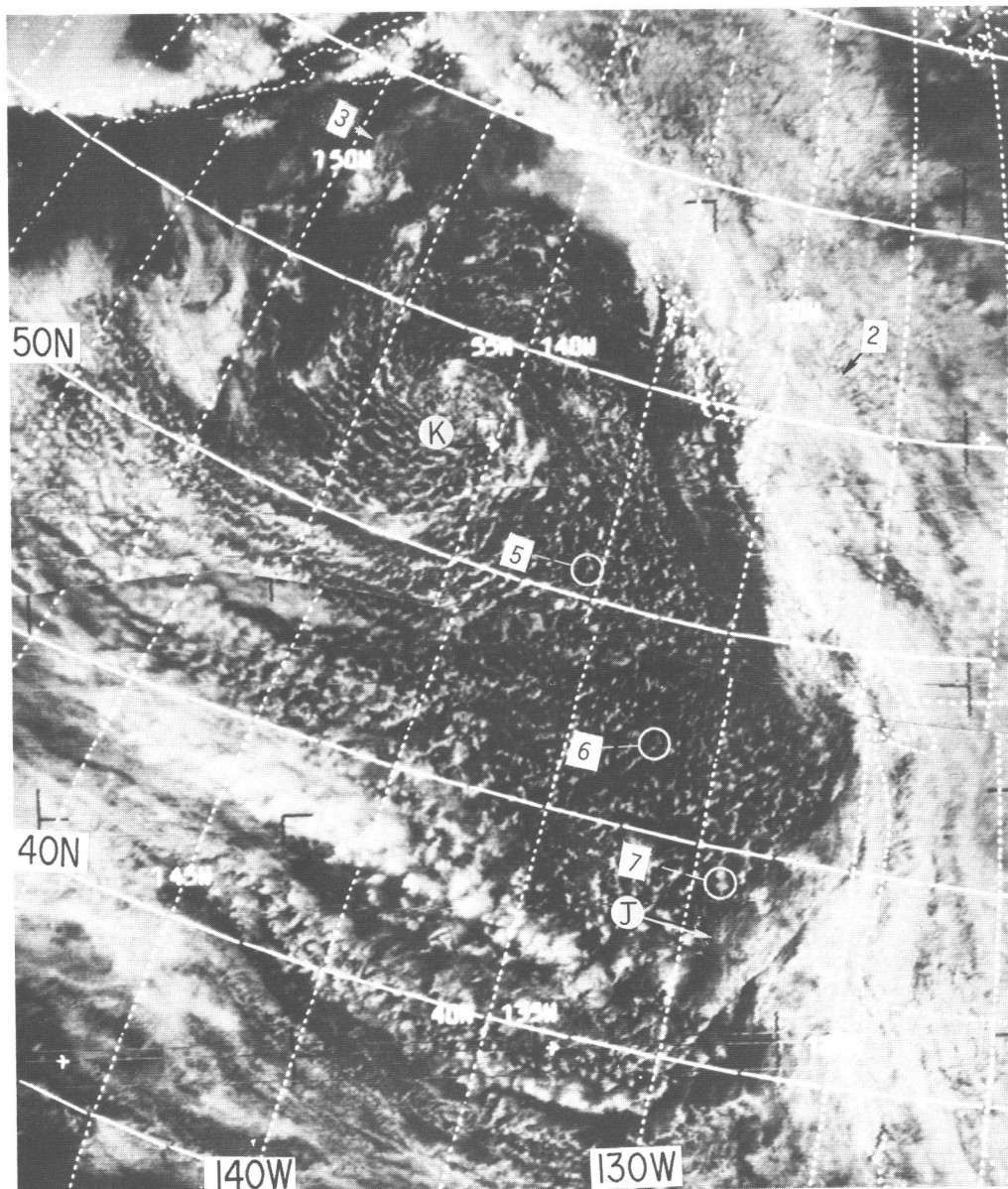


FIGURE 1.—ESSA 9, Pass 5453, 2243 GMT, May 8, 1970.



FIGURE 2.—Aircraft view, 22,000 ft, 2047 GMT, May 8, 1970



FIGURE 3.—Aircraft view, 26,000 ft, 2200 GMT, May 8, 1970.

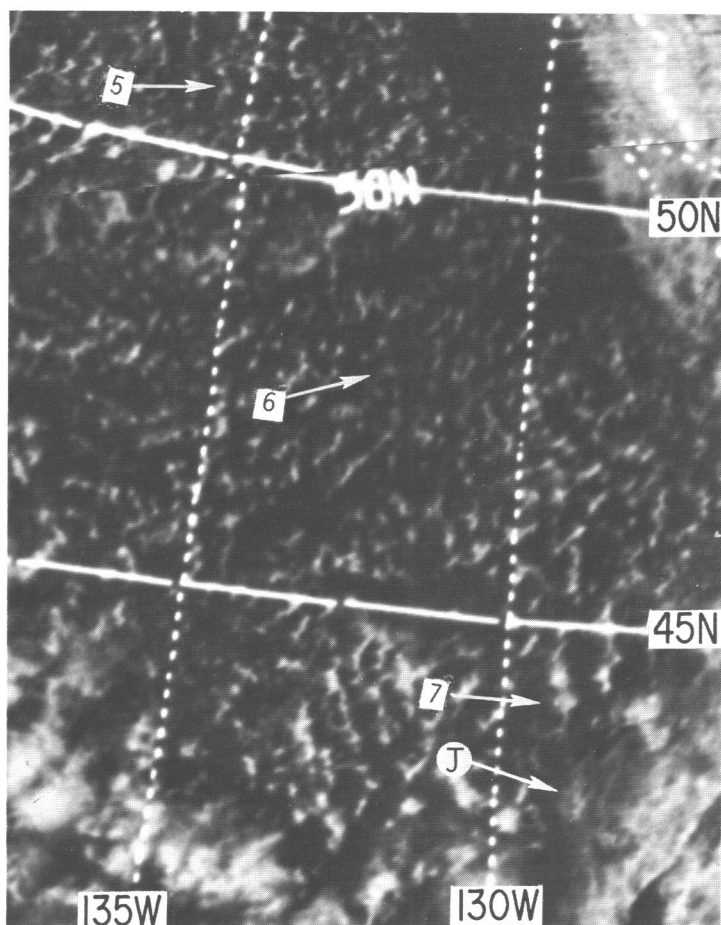


FIGURE 4.—Enlarged ESSA 9 view from figure 1, 2243 GMT, May 8, 1970.



FIGURE 5.—Aircraft view, 26,000 ft, 2355 GMT, May 8, 1970.



FIGURE 6.—Aircraft view, 26,000 ft, 0038 GMT, May 9, 1970.

surface Low was located in the Gulf of Alaska (K). On the same day, Thomas Keegan<sup>1</sup> departed from McClellan Air Force Base, Calif., on a special reconnaissance flight that followed a northward path along the frontal band, then westward across the Gulf of Alaska to 150°W longitude and finally southeastward over the open cellular cloud field behind the front. Figures 2, 3, and 5 through 7, show the appearance of some of the observed clouds from aircraft flight levels. [These figures are keyed to the satellite view (fig. 1) and the area enlargement (fig. 4).]

Figure 2 was taken from an altitude of 22,000 ft near the Babine Mountains in Canada. Keegan reported conditions to be overcast with some breaks below. The higher layer of wave clouds (R) was estimated to be 3,000 to 5,000 ft above the main overcast layer.

Figure 3 shows an area of stratiform clouds with a few cloud tops extending above the main cloud layer. Keegan reported a thin layer of cirrus over this area. The top of the cirrus layer (Y) and the top of the haze layer (T) can be seen on the horizon of this view. Only the stratiform clouds are detectable in the satellite pictures.

Figures 5 and 6 show the alternating cumuliform clouds and open areas which produce the typical open cellular cloud pattern found behind a cold front. Note that the cumuliform clouds in figure 5 appear slightly more developed than those in figure 6. This slight difference in vertical development is also apparent in the satellite views (figs. 1 and 4); the open cells at 5 appear slightly brighter

<sup>1</sup> Thomas J. Keegan of the Air Force Cambridge Research Laboratories, Bedford, Mass., took all of the photographs from the aircraft.



FIGURE 7.—Aircraft view, 26,000 ft, 0105 GMT, May 9, 1970.

than those at 6. The view in figure 7 was taken farther south over the closed cells at 7 (fig. 4). These clouds appear quite uniform with a few tops just penetrating the smooth overcast. This photograph was taken looking southeastward, and the cirrus layer which can be seen on the horizon (J) is part of the cirrus band (J) that appears in the satellite views.

This discussion compares the appearance of clouds from both aircraft and satellite observing levels. The aircraft photographs serve to illustrate some of the fine details which can be determined from satellite data.